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claim 2, wherein the cleaning layer is formed on the lower coating layer by a wet-on-wet coating method while the lower coating layer is still wet.

REMARKS

Introduction

The Non-Final Office Action was mailed on March 13, 2003, in connection with the above-identified patent application (the "Office Action"). Accordingly, this Response is timely filed.

Claims 1-7 were pending in the application. Claims 1-7 stand rejected. By this Amendment, applicants have amended claim 1 and cancelled claim 3, without prejudice. Accordingly, claims 1, 2 and 4-7 are presently in the application. Claim 1 is the sole independent claim.

Prior to addressing the rejections set forth in the Office Action, Applicants take this opportunity to set forth the following brief remarks in connection with their invention, which relates to a cleaning medium for a magnetic recording apparatus. Recording and reproduction with a magnetic recording apparatus can be performed by sliding a magnetic medium against a magnetic head. Over time reproduction output is decreased if the powders are scratched off the magnetic tape onto the surface of the magnetic head. Accordingly, a cleaning medium, such as a cleaning tape for an apparatus which uses magnetic tape, can restore the reproduction output.

The invention provides a cleaning medium, such as a cleaning tape, for a magnetic recording medium that is capable of sliding along the contour of a head, causing less head abrasion, yet still, capable of doing acceptable cleaning, regardless of the form of the magnetic

head, and capable of improving the condition of the magnetic head without scratching the tip of the head.

Claim 1 has been amended to clarify the terminology of a “cleaning medium” as a cleaning tape, for which support can be found at Par. [0002] and in claim 1 as filed. This clarification is in no way narrowing, as claim 1 had always referred to a cleaning tape. Claim 1 has also been amended to further clarify the nature of the cleaning layer as a layer constructed to remove debris from a magnetic recording apparatus for which support can be found at Pars. [0002] and [0012]-[0013]. Again, this clarification is in no way narrowing, but is inherent in the description of a cleaning layer.

Applicants have also amended claim 1 to include the features of cancelled claim 3 – namely, that the surface of the cleaning layer has from 5 to 80 protrusions, which have a height from 35 to 100 nm/900 μm^2 , and that the cleaning layer is to contain a combination of fatty acid, fatty acid amide and fatty acid ester. Applicants respectfully submit that no new subject matter has been added by this amendment.

The Rejections
Under 35 USC § 112

Claim 2 was rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The Examiner alleged that describing a polymer by its “short/long” chain and cyclic structure or “polar group-containing long chain polyol” is not fully descriptive. Applicants respectfully traverse this rejection.

Applicants respectfully submit that the specification, as filed, enables one skilled in the art to make or use the invention. Detailed descriptions are present in the specification to describe and support the terms “short chain,” “long chain,” and “polar group-containing long chain polyol.” A specification disclosure that contains a teaching of the manner and process of making and using an invention in terms that correspond in scope to those used in describing and defining the subject matter sought to be patented is to be taken as being in compliance with the enablement requirement unless there is reason to doubt the objective truth of the statements contained therein. See MPEP, Vol. 2, § 2164.04 (2001).

Claim 2 requires inter alia, a polyurethane that is the reaction product of a polyol and a diisocyanate, such that the resin includes a short chain diol component having a cyclic structure. The term “short chain diol component having a cyclic structure” is specifically discussed in the specification:

[0031] As the short chain diol component having a cyclic structure which is a starting material of the polyurethane resin, the compounds capable of being selected from diols having an aromatic or alicyclic group, such as bisphenol A, hydrogenated bisphenol A, bisphenol S, hydrogenated bisphenol S, bisphenol P, hydrogenated bisphenol P, cyclohexanedimethanol, cyclohexanediol, and hydroquinone, and the ethylene oxide adducts and propylene oxide adducts of them and having a molecular weight of less than 500 are preferred. Of these, bisphenol A, hydrogenated bisphenol A, and the ethylene oxide adducts, and propylene oxide adducts, of them are preferred. Hydrogenated bisphenol A is more preferred

Claim 2 also requires a long chain polyether polyol component. The term “long chain polyether polyol component” is discussed in the specification:

[0032] As the long chain polyether polyol component which is a starting material of the polyurethane resin, polyalkylene glycol,

e.g., polypropylene glycol, polyethylene glycol and polytetramethylene glycol, and polyether polyols obtained by adding polyethylene oxide or polypropylene oxide to cyclic diols such as bisphenol A, hydrogenated bisphenol A, bisphenol S, or bisphenol P are used. Propylene oxide adducts of bisphenol A, ethylene oxide adducts of bisphenol A, ethylene oxide adducts of hydrogenated bisphenol A, and propylene oxide adducts of hydrogenated bisphenol A are preferably used. The molecular weight of the long chain polyether polyol component is from 500 to 5,000, preferably from 600 to 3,000 ...

Finally, claim 2 requires a polar group – containing long chain polyol component. The term “polar group-containing long chain polyol component” is discussed in the specification:

[0034] The polar group of the polar group-containing long chain polyol component which is a starting material of the polyurethane resin is selected from the group consisting of --SO₃M, --OSO₃M, --COOM, --PO₃M₂, --OPO₃M₂, --NR₂ and --N⁺R₂R'COO⁻ (wherein M represents a hydrogen atom, an alkali metal, an ammonium, and R and R' each represents an alkyl group having from 1 to 12 carbon atoms). As the polyol skeletal structure, polyester polyol, polyether polyol, polyether ester polyol and polycarbonate polyol are used. The specific examples of the polar group-containing long chain polyol components include polar group-containing polyester polyols obtained by dehydrocondensation of dicarboxylic acid or glycol having a polar group, such as sodium 5-sulfoisophthalate, potassium 5-sulfoisophthalate, sodium sulfoterephthalate, potassium terephthalate, sodium 2-sulfo-1,4-butanediol, potassium 2-sulfo-1,4-butanediol, sodium bis (2-hydroxyethyl) phosphinate, dimethylolpropionic acid, sodium dimethylolpropionate or sodium sulfosuccinate with other glycol or dicarboxylic acid; polar group-containing polyester polyols obtained by ring opening polymerization of lactone such as .epsilon.-caprolactone with the above polar group-containing diol as the initiator; and polar group-containing polyether diols obtained by adding alkylene oxide such as ethylene oxide or propylene oxide to polar group-containing diol.

Applicants respectfully submit that to the person skilled in the art, the terms, “short chain diol component,” “long chain polyether polyol component,” and “polar group-containing long

chain polyol component” are adequately described so as to enable one skilled in the art to make, use or understand the invention.

The Examiner rejected claim 6 under 35 U.S.C. § 112, first paragraph, on the ground that it contains subject matter that is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the Examiner noted that describing the polyurethane as having 3 to 20 OH groups per one molecule does not fully describe the polymer. Applicants respectfully traverse this rejection.

Example I, of the application’s specification, provides a descriptive example of the present invention – namely, synthesizing a polyurethane resin. Par. [0130] is clear that the OH content/molecule is adjusted by adjusting the content of 4,4-diphenylmethanediisocyanate (“MDI”), as shown in Table I-1, and the content of the OH of the polyurethane resin is shown by the number of OH group per one molecule computed from the number average molecular weight in terms of polystyrene found by using the OH value obtained according to the test method of JIS K0070 and GPC.

Further, as claim 6 depends from claim 2, the polyurethane resin as described therein, is characterized as having among 3 to 20 OH groups per one molecule. Thus, in combination with the fact that the OH content is described as being adjusted by adjusting the MDI content, applicants respectfully submit that claim 6 is adequately described so as to enable one skilled in the art to make or use the invention.

The Examiner rejected Claims 1-7 under 35 U.S.C. § 112, first paragraph on the ground that it contains subject matter that is not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the Examiner noted that the specification does not define that which makes a medium a "cleaning" medium.

Applicants submit that the term "cleaning medium" is adequately defined and supported in the specification in accordance with 35 U.S.C. § 112, first paragraph, so as to enable one skilled in the art to make and/or use the present invention.

As stated in Par. [0002], "a cleaning medium, such as a cleaning tape, is used to restore the reproduction output by cleaning the stain adhered on the surface of the magnetic head," to recover the reproduction output that is lowered if powders scratched off the magnetic tape and the dust are adhered to the surface of the magnetic head. Eventually, without any type of cleaning medium, the output cannot be obtained at all. Par. [0002]. In any event, applicants have amended claim 1 to incorporate the parenthetical regarding a tape into the preamble and clarified that the medium is a tape that cleans the head as it slides along the head.

In view of the foregoing, applicants respectfully request withdrawal of these rejections.

The Rejections
Under 35 U.S.C. § 102(b)

In the Office Action, claims 1-2 and 4-7 were rejected under 35 U.S.C. § 102(b), as being anticipated by U.S. Patent No. 5,489,466 to Inaba et al. and U.S. Patent No. 5,747,157 to Hashimoto et al., both of which are directed to recording tapes.

Specifically, the Examiner noted that Inaba et al. teaches a magnetic recording medium comprising a nonmagnetic support, a lower nonmagnetic layer and an upper magnetic layer. While the Examiner conceded that Inaba et al. does not refer to these layers as cleaning and

lower coating layers, the Examiner did take the position that since they are of the same material, they are functional equivalents. Applicants respectfully traverse this rejection.

A claim is anticipated only if each element as set forth in the claim is found, either expressly or inherently, in a prior art reference. See MPEP, § 2131 (8th Ed. 2003) (citing Verdegaal Bros. v. Union Oil Co. of Ca., 814 F.2d 628, 631 (Fed. Cir. 1987)). Claim 1, as filed, was directed to a cleaning medium, which those of ordinary skill in the art would understand is a medium that cleans a head. The references are directed to recording tapes, the very source of the debris. Claim 1, as amended, specifies that the cleaning layer is constructed to be able to remove debris from the surface of a head as it slides along the head. It now also affirmatively recites the presence of 5 to 80 protrusions, which have a height from 35 to 100 nm per 900 μm^2 , as well as that the cleaning layer contains fatty acid amide, fatty acid and fatty acid ester.

Therefore, applicants respectfully submit that independent claim 1 is not anticipated by, or obvious in view of Inaba et al. and the rejection should be withdrawn.

Applicants further respectfully submit that the dependent claims describe features that further support the patentability of those claims. However, in the interest of brevity and because the patentability of claim 1 appears to be clear, applicants will not address the specific dependent claims individually at this time. Nevertheless, applicants respectfully submit that the process steps of claim 7 affect the final structure in a way that is otherwise difficult to characterize and that these features do add patentable significance.

The Rejections
Under 35 U.S.C. § 103(a)

Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over a proposed hypothetical combination of Inaba et al in view of U.S. Patent No. 5,747,157 to Hashimoto et al. Applicants traverse this rejection. First, applicants note that Claim 2 depends from claim 1 and is thus subject to the remarks provided above with regard to the rejections based on Inaba et al. Applicants thus respectfully submit that the present invention, as recited by claim 2, is not taught by Inaba et al.

Hashimoto et al. discloses a binder that improves the dispersability of ferromagnetic powders to improve the operation durability and storability of magnetic recording media. On the other hand, the present invention deals with a cleaning medium for a magnetic recording apparatus. Those of ordinary skill in the art seeking to create a cleaning medium, would not be concerned with improving recording properties and therefore, would not look to Hashimoto to improve the properties of Inaba. Furthermore, Hashimoto does not describe the cleaning layer as now required by claims 1 and 2.

Accordingly, applicants respectfully submit that neither Inaba et al. nor Hashimoto et al, either taken alone or in the hypothetical combination proposed in the Office Action, or with the knowledge of a person with ordinary skill in the art, neither teaches nor suggests applicants' invention as recited in claim 2 of the present application. Accordingly, applicants respectfully request withdrawal of the rejection of that claim under 35 U.S.C. § 103(a).

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over a proposed hypothetical combination of U.S. Patent No. 5,489,466 to Inaba et al. in view of U.S. Patent No. 5,530,609 to Koga et al. Applicants respectfully traverse this rejection.

Specifically, the Examiner noted that Inaba et al. teaches adding fatty acids to the upper layer, but is silent to protrusions existing, while Koga et al. teaches that it is known to provide a magnetic field to a coating layer. The Examiner alleged that it would have been obvious to one of ordinary skill in the art to modify the magnetic media of Inaba et al. to provide protrusions of certain degree, since Koga teaches applying magnetic fields to a coating layer. However, nowhere does Koga et al. suggests the formation of protrusions, or a combination with Inaba et al.

Moreover even the combination of Koga et al. and Inaba et al. does not describe the number and height of protrusions, which is an important characteristic of the cleaning medium. As stated in Par. [0067], if the number of protrusions is too small, or the protrusion height is not within the correct range, the cleaning property is unacceptable and the magnetic recording head may not be cleaned properly, or may become scratched.

As stated in the application's specification:

[0067] A proper cleaning property to an MR [magnetic recording] head is given by virtue of the above range of the protrusion distribution. When the number of protrusions is not enough even if the heights of protrusions are within the above range, a cleaning property is reduced and the stain on an MR head cannot be removed, while when the protrusions are too many, head abrasion is great and an MR head is scratched after cleaning.

Further, the height of the protrusions on the surface of the cleaning layer is adjusted by controlling the conditions of calendaring. See Pars. [0069]–[0071]. For example, a treatment

can be carried out with a seven-roll calendar composed of metallic rolls and epoxy resin rolls.

Thus, there is no way that Koga and Inaba would teach one to make the claimed head cleaner.

In addition, Inaba et al. contains no description to use a fatty acid amide. The use of particular lubricants – combinations of the fatty acid amide, fatty acid and fatty acid ester) makes the frictional coefficient with the head most suitable to reduce the abrasion to the head in addition to the control of the protrusions on the surface of the cleaning layer.

The use of these three materials leads to unexpected benefits. For example, Table II-2, page 19, demonstrates that scratches can develop on the magnetic recording head and the preferred abrasion qualities to the head were not obtained when the fatty acid amide, fatty acid and fatty acid ester combination was not used as a lubricant compound of the cleaning layer. Further, as heretofore stated, Inaba et al. does not teach or suggest a cleaning medium for a magnetic recording apparatus, but rather a magnetic recording medium.

Further, the limitations of claim 3, are now included in claim 1 and as such, are subject to the distinguishing remarks provided above with regard to the rejections based on Inaba et al. in the Office Action. Applicants respectfully submit that the present invention, as recited by the amended claim 1, is not taught by Inaba et al. in view of Koga et al.

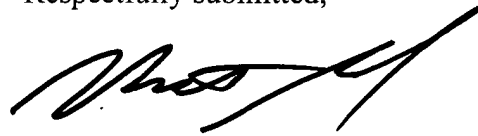
Accordingly, applicants respectfully submit that neither Inaba et al, nor Koga et al., either taken alone or in the hypothetical combination proposed in the Office Action, or with the knowledge of a person with ordinary skill in the art, neither teaches nor suggests applicants' invention as recited in amended claim 1 of the present application. Accordingly, applicants traverse the rejection under 35 U.S.C. § 103(a).

Conclusion

Applicants thus believe that all claims pending in the present application (i.e., claims 1, 2 and 4-7) are in condition for allowance. Accordingly, applicants respectfully request reconsideration of the present application in view of the remarks provided herein.

Any additional fees or charges required at this time in connection with the present application are hereby authorized to be charged to Deposit Account No. 19-4709.

Respectfully submitted,



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